

What is claimed is:

1. An apparatus comprising:
 - 2 a differential preamplifier stage having a differential output; and
 - 3 a distributed differential amplifier stage having a differential end
- 4 termination interface coupled to the differential output.

1. 2. The apparatus of claim 1, further including feedback to manipulate a signal to be provided to the distributed differential amplifier stage.
1. 3. The apparatus of claim 1, further including a bridging element coupled between a differential input of the distributed differential amplifier stage and a differential output of the distributed differential amplifier stage.
1. 4. The apparatus of claim 3, wherein the bridging element comprises a microstrip transmission line segment.

1. 5. The apparatus of claim 1, wherein the distributed differential amplifier stage comprises a first output transmission line and a second output transmission line differentially coupled to the first output transmission line.
1. 6. The apparatus of claim 5, wherein the first output transmission line and the second output transmission line are coupled by at least one passive element.
1. 7. The apparatus of claim 1, wherein the differential end termination interface comprises at least one passive element coupled between a first line and a second line of the differential output.

1 8. An apparatus comprising:
2 a differential preamplifier stage coupled to a distributed differential
3 amplifier stage, wherein the distributed differential amplifier stage has a first output
4 transmission line differentially coupled to a second output transmission line.

1 9. The apparatus of claim 8, wherein the distributed differential amplifier
2 stage has a differential end termination interface.

1 10. The apparatus of claim 9, wherein the differential end termination
2 interface couples a differential output of the lumped differential preamplifier stage.

1 11. An apparatus comprising:
2 a differential traveling wave amplifier having a differential input and a differential
3 output; and
4 at least one bridging element coupled between the differential input and the
5 differential output.

1 12. The apparatus of claim 11, further comprising a first transistor coupled to
2 a first line of the differential input and a second transistor coupled to a first line of the
3 differential output.

1 13. The apparatus of claim 12, wherein the at least one bridging element is
2 coupled between the first transistor and the second transistor.

1 14. The apparatus of claim 11, further comprising a current source coupled
2 between first and second lines of the differential output.

1 15. The apparatus of claim 11, further comprising at least one damping
2 element coupled to the at least one bridging element.

1 16. A system comprising:
2 a differential preamplifier stage having a differential output;
3 a distributed differential amplifier stage having a differential end
4 termination interface coupled to the differential output; and
5 an optical fiber coupled to the distributed differential amplifier stage.

1 17. The system of claim 16, further including an optical modulator to
2 modulate a signal received from the distributed differential amplifier stage.

1 18. The system of claim 16, further comprising feedback to manipulate a
2 signal to be provided to the distributed differential amplifier stage.

1 19. The system of claim 16, further including a bridging element coupled
2 between an input and an output of the distributed differential amplifier stage.

1 20. The system of claim 19, wherein the bridging element comprises a
2 transverse electromagnetic transmission line segment.

1 21. The system of claim 16, wherein the distributed differential amplifier
2 stage further includes a first output transmission line differentially coupled to a second
3 output transmission line.

1 22. The system of claim 21, further comprising an output differential end
2 termination interface coupled to the first and second output transmission lines.

1 23. A method comprising:
2 terminating a differential output of a differential preamplifier stage via a
3 differential end termination interface of a distributed differential amplifier stage.

1 24. The method of claim 23, further including modulating an output signal of
2 the distributed differential amplifier stage.

1 25. The method of claim 23, further including limiting an amplitude of the
2 differential output.

1 26. The method of claim 23, further including feeding back the differential
2 output to manipulate the differential output.

1 27. The method of claim 23, further including bridging an input line and an
2 output line of the distributed differential amplifier stage with a transverse electromagnetic
3 transmission line segment.

1 28. An apparatus comprising:
2 a preamplifier stage having a preamplifier output;

3 a differential traveling wave amplifier coupled to receive the preamplifier output;
4 and

5 at least one feedback control element coupled between the preamplifier stage and
6 the differential traveling wave amplifier to adjust a swing of the preamplifier output.

1 29. The apparatus of claim 28, wherein the at least one feedback element is
2 coupled to adjust an alternating current swing and a direct current voltage level of the
3 preamplifier output.

1 30. The apparatus of claim 28, further comprising a differential end
2 termination interface coupled to the preamplifier output.